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In the Matter of Unlicensed Use of the 6 GHz Band	ET Docket No. 18-295
Expanding Flexible Use of the Mid-Band Spectrum Between 3.7 GHz and 24 GHz	GN Docket No. 17-183

Comments of Users in the Gulf of Mexico Dependent on 6 GHz Microwave for Critical Communications

The undersigned are oilrig operators, petroleum exploration companies and the companies that service oilrigs in the Gulf of Mexico ("GOM 6 GHz Users" or "Users"), all of whom use communications systems that rely on 6 GHz microwave backhaul for critical communications, including industrial controls, monitoring systems, and public safety systems. Environmental safety, security and lives depend on the integrity of the 6 GHz backhaul system.

These comments are submitted in response to the Notice of Proposed Rulemaking[1] in these proceedings regarding the unreasonable risk of interference to critical communications in the Gulf of Mexico by the expansion of unlicensed use in the 6 GHz band. The GOM 6 GHz Users strongly urge the

[1] *See Unlicensed Use of the 6 GHz Band,* Notice of Proposed Rulemaking, ET Docket No. 18-295, *et al.* (October 23, 2018)(hereafter "6 GHz NPRM").

FCC to exclude the Gulf of Mexico from any expanded unlicensed use of 6 GHz and provide protections in the vicinity of licensed antennae arrays where the backhaul network crosses the beach.

I. 6 GHz is a critical communications lifeline in the Gulf of Mexico

The communications network in the Gulf of Mexico serves over 300 oil and gas platforms, spread over approximately 24,000 square miles of sea water. The network provides WiMax access and Tier One 4G LTE service (currently being upgraded to 5G), with of the Users handles its communications in different ways, the network is used for communicating with in-bound supply ships and helicopters, critical SCADA, industrial controls and monitoring, weather monitoring, news and alerts, and, importantly, emergency and public safety communications.[2]

All the platforms are different. Some are unmanned, where constant and uninterrupted communications are required for continued operation; for these platforms, uninterrupted communications with industrial controls and sensor monitoring are indispensable. Manned platforms can have rotating crews from approximately 45 personnel up to 150 personnel, whose safety depends on emergency communications. Some of the platforms are within a mile or so of other platforms, but many more are widely dispersed, so that that links can be up to 30 miles apart. Unlike land-based networks, this at-sea network is constantly changing as rigs come into the area, leave or relocate elsewhere in the Gulf of Mexico.

The 6 GHz spectrum is particularly well-suited for backhaul in the Gulf of Mexico specifically because of its excellent propagation characteristics over water and in the presence of moisture and weather. As stated in the FCC's NPRM, the subgroups for Fixed Use are "heavily used by point-to-point microwave links, including critical links that must maintain a high level of availability."[3] Its reliability and

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[2] *Id* at Para. 9. *See also Notice of Ex Parte of APCO International,* GN Docket No. 17-183 (March 29, 2018).
[3] 6 GHz NPRM, para. 20.

available channel bandwidth, therefore, is optimal for a network that carries emergency communications, public safety and first responder communications and other critical communications.

II. The FCC's Proposed Rules Will Cause Unacceptable, Potentially Dangerous Interference with Critical Communications

The sea-based 6 GHz communications network is unique and distinct from land-based systems, and the use cases for unlicensed use of 6 GHz in the Gulf of Mexico likewise presents unique challenges. First, unlike the density and the dispersion of users on land, the potential users in the Gulf of Mexico are few, but tightly grouped around the platforms that support the 6 GHz backhaul network, necessarily in the line of sight of other stations. The access points would inevitably have to be located on the same platform as the backhaul microwave antennae. These factors increase the likelihood of crippling interference. While the network has branches, harmful interference could knock out large sectors of the network. As discussed above, 6 GHz is optimal for propagation at sea, but so is harmful interference in that range, much more so than on land. The FCC must recognize the unique nature of the 6 GHz network over the large expanse of the Gulf of Mexico and its significant difference from all land-based networks.

III. The Benefit of Including the Gulf of Mexico Is Outweighed by the Impact to Public Safety

The corollary to the concentration of access points and users around the antennae of the 6 GHz backhaul network in a way that will increase interference is that the concentration of users benefited by the unlicensed 6 GHz will only be measured in a very few score on each platform. The FCC's proposed expanded unlicensed use would only benefit several thousands of potential users in the 24,000 square mile area served by the network, while at the same time endangering those same users.

IV. The Protections and Safeguards for Proposed for 6 GHz Fixed Services Are Totally Inadequate for the Gulf of Mexico Network

The FCC proposes protections and safeguards for Fixed Service in the U-NII-5 and U-NII-7 sub-bands, both of which affect the 6 GHz network in the Gulf of Mexico; the protections and safeguard are proposed with standard-power access points, unlike the sub-bands service Mobile Service FSS which have low-power access points. The FCC suggests using standard access points only on frequencies within the sub-bands as determined by an Automatic Frequency Coordination (AFC) system.[4]

The Users affirm that unlicensed use of the two sub-bands in the Gulf of Mexico without AFC would create catastrophic interference for the 6 GHz network, endangering critical, emergency, public safety and industrial control communications. However, AFC systems directing traffic to adjacent channels will not prevent harmful interference on the 6 GHz network. Out-of-band emission (OOBE) limits are insufficient to protect vital communications links. In this regard, the Users support the position of the Fixed Wireless Communications Coalition's ("FWCC") technical work in urging that "adjacent channel interference arises...in the FS receiver" where OOBE limits will not be effective.[5]

Moreover, no AFC system will be able to determine an effective exclusion zone, since the large majority of potential users, if not all, will be directly in the line-of-sight of the point-to-point network.[6] The unlicensed access points and its users will be concentrated on the platform of each succeeding link in the backhaul network.

Furthermore, the 6 GHz long-haul fixed microwave links over highly reflective media are designed to mitigate multipath fading using proper antenna heights in conjunction with space diversity receivers in order to mitigate seasonal variation of refractivity index. As such, third party 6 GHz transmitters injected anywhere close to the primary line-of-sight link would cause a substantial noise floor to increase.

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[4] 6 GHz NPRM, para. 20.
[5] FWCC October 15, 2018 *Ex Parte*.
[6] 6 GHz NPRM, para. 37.

V. The 6 GHz Backhaul Network is Essential for the Safety of Oil and Gas Operations and for New Government Continuous Monitoring Regulations

Offshore energy production operations have become safer and more secure over the last decade, in part through greatly improved communications between oil production platforms and on-shore management, monitoring activities and public safety entities. Recently, the Bureau of Safety and Environmental Enforcement (BSEE) of the Department of Interior has required real-time monitoring of blow-out preventer (BOP) for oil production operations in deep water. According to BSEE, the BOP monitoring includes the ability:

> to gather and monitor real-time well data using an independent, automatic, and continuous monitoring system capable of recording, storing, and transmitting data for the BOP control system, the well's fluid handling system on the rig, and the well's downhole conditions with the bottom hole assembly tools.[7]

The effectiveness and reliability of real-time monitoring is dependent on continuous, uninterrupted connectivity, and the Users' compliance with real-time monitoring requirements depend on the 6 GHz network. No other communications options exist that have the same reliability, availability and attributes of this network.

VI. Conclusion

The FCC 6 GHz NPRM effectively makes the case for the demand for more spectrum devoted for Wi-fi, small cell and unlicensed use.[8] However, these demands are land-based, and the aspects of an at-sea network, and in particular, the 6 GHz backhaul network in the Gulf of Mexico are uniquely different from land-based systems and are not suited to FCC's proposals. The expansion of the unlicensed use of 6 GHz in the Gulf of Mexico, even with the safeguards and protections proposed for land-based operations, will

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[7] Bureau of Safety and Environmental Enforcement, *Blowout Preventer Systems and Well Control Rule Proposed Revisions Fact Sheet* (updated April 26, 2018).

interrupt and interfere with public safety, emergency and other critical communications, while the benefits of the expansion in the Gulf of Mexico will be *de minimus*. The Users strongly urge the FCC to exclude the Gulf of Mexico from any regulations for expansion of unlicensed use in 6 GHz and to provide adequate protections around shore stations where the 6 GHz backhaul network crosses the beach.

Respectfully submitted

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[8] 6 GHz NPRM, para. 3-7.